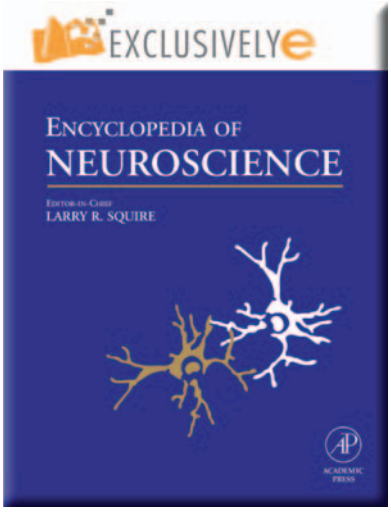

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Dreams and Nightmares in PTSD

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Clinical Significance of Nightmares in Posttraumatic Stress Disorder

Posttraumatic stress disorder (PTSD) refers to symptoms of reexperiencing, avoidance, and hyperarousal that persist for more than 1 month after exposure to a traumatic event. Violent crimes, including rape, physical assaults, and combat exposure, constitute traumatic events that involve threat to integrity of the self or to others and are accompanied by intense fear, helplessness, or horror. Epidemiological studies indicate that community prevalence estimates of PTSD are in the range of 1–10%, with higher estimates reported for victims of interpersonal violence (20–30%) and combat veterans (15–30%). Recommended first-line treatments of PTSD include selective serotonin reuptake inhibitors (SSRIs) and cognitive-behavioral interventions such as prolonged exposure and cognitive restructuring.

Nightmares are a core feature of PTSD. As many as 90% of trauma-exposed individuals who develop PTSD report disturbing dreams that bear varying degrees of resemblance to the actual traumatic event. Growing evidence suggests that trauma-related nightmares may directly contribute to the pathophysiology of PTSD. The persistence of nightmares and sleep disruption 1 month posttrauma increases the likelihood of developing PTSD at follow-up assessments. Moreover, a personal history of nightmares prior to trauma exposure can predict the severity of PTSD and other posttraumatic psychiatric symptoms. Frequent recurrent nightmares about a traumatic event can persist for years and even decades after the trauma. Trauma-related nightmares disrupt sleep and independently contribute to increased severity of daytime PTSD symptoms and increased alcohol use in trauma survivors, and adversely affect quality of life and perceived physical health.

Nightmares and Sleep following Trauma Exposure and in Chronic PTSD

In healthy persons, elaborate dream recall is more prominent following awakening from rapid eye movement (REM) sleep than from awakening from non-REM (NREM) sleep. In trauma-exposed adults, two preliminary studies suggest that disruption of REM sleep, as indicated by increased sleep stage transitions and arousal, as well as increased sympathovagal tone during REM sleep are associated with increased PTSD symptom severity and may increase the likelihood of developing PTSD at follow-up assessments. Thus, REM sleep disruption and increased arousal during REM sleep may increase one's vulnerability to experience vivid nightmares following trauma exposure and to develop PTSD.

REM sleep disturbances have been most consistently reported in patients suffering from chronic PTSD, but other sleep alterations, such as reduction in slow-wave sleep, have also been documented. More general sleep disturbances, such as increased sleep latency, total sleep time, and duration of and number of nocturnal awakenings, have been reported in some, but not all, studies. Polysomnographic studies based on refined objective measures of central and peripheral physiological arousal, such as quantitative electroencephalography and quantitative electrocardiography, have observed indices of heightened central and peripheral arousal during sleep in patients suffering from PTSD. PTSD in patients who report trauma-related nightmares show increased duration of wakefulness after sleep onset in comparison to those who report nontrauma-related nightmares. However, REM sleep parameters, or more global sleep measures, do not correlate with specific aspects of nightmare content. These observations suggest that in chronic PTSD, trauma-related nightmares may represent expressions of a more global sleep disturbance related to heightened arousal.

Dream Recall and Nightmare-Related PTSD

Studies on dream recall frequency following trauma exposure have yielded inconsistent results. Increases in dream recall frequency following a traumatic event have been reported and the hypothesis put forth is that dream recall is facilitated by the intensity, affective charge, and references to the victims' trauma depicted in their dreams. Conversely, significant decreases in dream recall have also been documented. These data, however, are largely based on retrospective assessments conducted many months or even several years following trauma exposure. It is possible that dream recall increases immediately following an individual's exposure to trauma and subsequently diminishes over time. One comparison of high-functioning Holocaust survivors, average-functioning Holocaust survivors, and controls found that the high-functioning survivors reported fewer dreams from REM sleep (33.7%), compared to the average-functioning survivors (50.5%)

and controls (80.8%). A reduction in dream recall may thus reflect improved posttrauma adaptation in this population.

Repetition of Trauma in Dreams

The recall of dreams that replicate the traumatic event experienced by trauma victims has been described in many populations, including war veterans, adults and children exposed to war, witnesses of violence and abuse, burn victims, and individuals exposed to natural disasters. A classification system for trauma-related dreams has been put forth. Posttraumatic dreams refer to the replication of the traumatic event during sleep or the introduction of the encapsulated memory of the trauma during sleep. Modified dreams present distorted themes, elements, or emotions from the trauma. Finally, disguised dreams represent the traumatic event symbolically or metaphorically. These categories form a continuum of replication (according to the extent to which the traumatic event is represented in the dream) and of repetition (i.e., the dream's recurrence). Empirical studies support this classification system. For example, in one study of Vietnam War veterans, 304 of 316 veterans reported combat-related nightmares. An examination of their dream narratives revealed that over half of the veterans reported realistic combat dreams, 21% reported plausible war sequences that they nevertheless had not experienced, and 26% reported dreams that alluded to the war, but also included fantastical and everyday elements. In addition, a laboratory study of war veterans found that only 21% of dreams exactly replicated the traumatic event, while the majority contained distortions related to the traumatic event. Similarly, one study of patients hospitalized following an accident or assault found that 46% of reported dreams replicated the traumatic event, 33% were dissimilar to the traumatic event while containing high levels of distress, and 19% showed little similarity to the trauma or distress.

Taken together, the results reveal changes in dream content with the passage of time and with improvement in the posttrauma reaction. Dreams recalled during the initial posttrauma phase tend to include some type of repetition of the trauma while subsequent phases are characterized by more symbolic representations of the trauma and greater integration of the individual's everyday life in recalled dream content.

Trauma and Dream Content

Several studies have reported salient alterations in the content of trauma victims' dreams. Some data suggest that when compared to the dream reports from controls, dreams recalled by trauma victims tend to be more ordinary and realistic and less salient, bizarre, and imaginative. The 'ordinary' quality of trauma victims' dreams may reflect an alteration in the process of dream construction or may be related to a protective mechanism which keeps traumatic images from intruding into everyday dreams.

Intense emotions have been documented in several studies of trauma victims' dreams. Feelings of horror, anxiety, rage, sadness, and frustration are among the most frequently reported. PTSD patients rate their nightmares as being significantly more distressing than do non-PTSD patients. Emotional preoccupations prior to bedtime may also play a role in the affective content experienced during subsequent sleep. The finding that one's mood prior to sleep is inversely related to positively or negatively experienced dream affect supports the idea that dreams may help regulate emotional equilibrium in traumatized individuals.

Some research has been directed at delineating relationships between measures of dream content and specific types of traumas.

Victims of Physical and Sexual Abuse

Themes of attack, pursuit, and of one's own death are more frequently found in the dreams recalled by victims of sexual abuse than in those recalled by control participants. Episodes of verbal and physical abuse are more evident in the dreams of physically abused women when compared to the dreams of controls. Although themes of violence and aggression often characterize women's nightmares, the nightmares reported by victims of sexual abuse are more likely to include unique themes of blood and dismemberment as well as a higher occurrence of male strangers. In addition, the dreams and nightmares of sexually abused women contain more frequent references to negative sexual activity, including themes concerning lack of trust and shame, guilt, jealousy, anger, and violence. These dreams often depict situations wherein elements of sex and aggression are confounded, in which sexuality is unpredictable and often results in fear. Victims of sexual abuse also frequently report the presence of serpents and worms in their dreams as well as references to both sexual and nonsexual body parts.

Victims of War and Violence

Exposure to an environment of war or violence is associated with dreams containing high proportions of aggressive and hostile human interactions. Themes involving immediate dangers to one's life appear more frequently in the dreams of Holocaust survivors, children that have been kidnapped, and children involved in car accidents than in nontrauma populations. It is not unusual for war veterans to report that their

traumatic dreams entail being killed in the place of their compatriots. A study of war-exposed Palestinian children found that traumatized children had more dreams with threatening strangers. Their dreams were often composed of attacks, anxiety, persecution, hostility, and nondesirable endings. In addition, nontraumatized children report more dreams of school and of their peers than do traumatized children.

That said, conflicting results exist regarding the impact of trauma and PTSD on dream content. For example, in addition to having more dreams with threatening strangers, victims of violence also report more dreams referring to their family, house, affiliations, and human connections than do controls.

Frequency of Dream-Related Disorders

Dream-related disorders, such as posttraumatic dreams, nightmares, bad dreams, and recurrent dreams, are the most frequently reported and most persistent symptoms exhibited by trauma victims. Several factors appear to mediate this association. First, a positive relationship exists between the degree and severity of trauma exposure and the frequency of dream-related disorders. Second, the victim's psychological reaction to trauma (e.g., level of anxiety) positively influences the occurrence of nightmares and other dysphoric dream experiences. Third, the time elapsed since trauma exposure appears to play an important role, with reductions in dream-related disorders occurring over time. However, it should be noted that dream disturbances can nevertheless persist for many years following the trauma.

Functional Hypotheses of PTSD-Related Nightmares

Many contemporary dream theorists suggest that dreaming is functionally significant and may subserve a biologically important function, but some argue that dreams are epiphenomenal to neurophysiological activity during REM sleep and have no value in and of themselves. While this overarching question on the function of dreaming is of phenomenological interest, the resolution of this debate is of little clinical relevance for chronic, frequent, and distressing nightmares in PTSD patients. However, understanding the possible role(s) of nightmares as one of the normal initial reactions to trauma exposure, which may also become a perpetuating condition contributing to maladaptive, chronic trauma response, has direct clinical implications regarding the development and refinement of effective nightmare-specific treatments. The following sections describe the main hypotheses put forth to explain the possible dual role of nightmares occurring posttrauma.

Nightmares and Emotional Adaptation to Trauma

Several neuropsychophysiological hypotheses of the function of dreaming have been adapted to explain the occurrence of nightmares after exposure to a trauma or other significant life events, and the role of nightmares in the pathogenesis and maintenance of PTSD. Freud proposed that nightmares reflect attempts to master anxiety and guilt associated with a traumatic experience, and to integrate traumatic experiences into one's psyche during sleep. Contemporary hypotheses are based on a similar premise – that dreaming serves a function of emotional adaptation to emotionally salient or traumatic events – and combine empirical observations supporting the role of REM sleep (and by association, dreaming) in learning, memory consolidation, emotional processing, and adaptation to stress. Given that REM sleep is associated with muscle atonia, and given the lack of detectable physiological activation during REM sleep episodes preceding awakening from nightmares, dreaming and REM sleep may provide a unique psychophysiological milieu during which traumatic memories can be reexperienced in the absence of physiological arousal. This process could facilitate the attenuation of emotional and physiological responses associated with these memories, leading to desensitization to the trauma-related memories, including a reduction of nightmares. Prospective dream collection studies in combination with repeated objective assessment of sleep patterns and other physiological parameters of central and peripheral arousal in people at high risk for trauma exposure (e.g., disaster workers, police officers, firefighters, deployed military personnel) are necessary to assess the role of nightmares in the recovery of trauma response and PTSD.

Stickgold proposed an explicit REM sleep model of the neurobiological substrates potentially subserving emotional processing and integration of trauma-related memories. Specifically, it is suggested that REM sleep provides a unique neurochemical and neurobiological brain state that allows the transfer of hippocampally mediated episodic traumatic memories and amygdala-dependent salient affect into cortically distributed semantic networks. It should be noted that the possibility has not been evaluated that PTSD-related nightmares may also reflect the failure of compensatory mechanisms aimed at preserving processes such as emotional adaptation, memory consolidation, and sleep continuity.

Sensitization Hypothesis of PTSD Nightmares

While the adaptation process may be successful in individuals who recover from trauma exposure, the persistence of nightmares in those who develop PTSD may, instead, reflect a failure of dreaming and REM

sleep to fulfill their role of emotional adaptation and memory integration. In this perspective, nightmares are the outcome of unsuccessful processing during dreaming and REM sleep. In addition, nightmares may directly contribute to the failure of the adaptation and integration process by promoting sensitization (rather than desensitization) to trauma-related memories. PTSD-related nightmares are often associated with awakenings and are accompanied by intense emotional and physiological arousal. Trauma-related nightmare content, sleep disruption induced by awakening from a nightmare, and heightened physiological and emotional arousal levels that follow such awakenings may contribute to reinforce the occurrence of nightmares and related distress during both wakefulness and sleep. In other words, the recall of nightmares can expose patients to their prior trauma and may even induce retraumatization, since PTSD nightmares often repeat a traumatic situation in whole or in part, whereas habituation to physiological arousal elicited by these memories does not occur.

There is evidence that frequent and distressing PTSD-related nightmares are associated with increased severity of daytime reexperiencing, arousal, and avoidance PTSD symptoms. Alternatively, some PTSD patients who show clinically significant improvements in PTSD following exposure-based therapy also report improvements in trauma-related nightmares, suggesting that habituation to trauma memories during wakefulness can also attenuate nightmare frequency, intensity, and related distress. Desensitization therapy has also been used successfully for the treatment of trauma-related nightmares. These observations support the hypothesis that chronic nightmares without physiological habituation may indeed contribute to the maintenance of PTSD by sensitizing patients to trauma memories.

Potential Psychophysiological and Neurobiological Underpinnings of PTSD-Related Nightmares

While several polysomnographic studies have been conducted in PTSD samples, these sleep measurement methods do not allow the identification of neurobiological underpinnings of trauma-related nightmares or, more generally, of PTSD during sleep. Such an endeavor requires the use of functional sleep neuroimaging approaches. Sleep neuroimaging has not yet been conducted in PTSD patients. However, animal models of the effects of fear conditioning on sleep, and neuroimaging sleep studies in humans, have provided valuable insights into the potential neurobiological underpinnings of altered REM and NREM sleep mechanisms following stress exposure PTSD, and into the neurobiology of normal sleep, respectively. While animal models and sleep imaging in healthy persons limit possible extrapolation of neurobiological underpinnings of trauma-related nightmares, findings derived from these two distinct fields provide evidence for functionally significant overlaps between the neurobiology of fear and sleep regulation.

Functional neuroimaging studies conducted during wakefulness in PTSD patients are consistent with animal models of fear conditioning. PTSD is associated with hyperresponsiveness of the amygdala to threat-related stimuli, and/or a with blunted response of medial prefrontal cortical regions, which exert inhibitory control over the amygdala. Other functional findings include increased thalamic activity with trauma-related stimuli in PTSD compared to non-PTSD subjects, and hyperresponsiveness of the noradrenergic system. Of note, neuronal activity in these structures cannot be captured by conventional sleep measurement methods, which further reinforces the need to use state-of-the-science sleep neuroimaging methods in patients with PTSD.

In rodents, cued fear conditioning increases REM sleep latency, decreases REM sleep duration and number of REM bouts, and increases pontogeniculooccipital (PGO) waves, a marker of alerting mechanisms during sleep and wakefulness analogous to REMs in humans. The effects of fear conditioning on REM sleep in rodents are mediated by amygdalar projections to brain stem regions involved in alerting response and REM sleep generation. Anatomically, the interconnections that the amygdala shares with the basal forebrain, hypothalamus, preoptic area of the anterior hypothalamus, brain stem reticular formation, and solitary tract nucleus allow the amygdala to influence both wakefulness-promoting and sleep-promoting areas. Neuronal firing of the amygdala varies across the sleep–wake cycle, and stimulation of the amygdala during REM sleep increases PGO waves in REM and NREM sleep, whereas inactivation of the amygdala with tetrodotoxin decreases sleep latency and increases slow-wave activity during wakefulness, REM sleep, and NREM sleep. Conversely, ablation of the amygdala in rhesus monkeys is associated with increased sleep consolidation and total sleep time. These findings indicate that the amygdala is an important modulator of sleep and wakefulness regulation mechanisms.

Sleep neuroimaging studies conducted in healthy persons have reliably shown that REM sleep is a natural activator of the amygdala and anterior paralimbic areas and of the medial pons and thalamus. REM sleep is also associated with relative deactivation of lateral prefrontal parietal regions and primary sensory cortices. These selective activation and deactivation

patterns during REM sleep relative to wakefulness have yielded the hypothesis that dreams may reflect the mental representations of high limbic activations in conjunction with deactivation of high-order cortical regions. NREM sleep is a natural deactivator of arousal-promoting structures.

The functionally significant interconnections between the amygdala and wakefulness- and sleep-promoting areas, the unique limbic activation and cortical deactivation patterns observed during sleep in healthy persons, and the functional neuroanatomical findings in PTSD patients during wakefulness all support a role for a heightened amygdalar activity during sleep in PTSD, and provide preliminary guidance for the investigation of the neurobiology of PTSD during REM and NREM sleep. While the relationship between heightened amygdalar activity and dream content cannot yet be ascertained, the role of the amygdala in acquisition of the fear response and the emotional salience of stimuli raises the possibility that heightened amygdalar activity during REM sleep also contributes to salient, negative aspects of dreams and nightmares.

Treatments of PTSD-Related Nightmares

Nightmares are closely related to sleep disturbances, including increased sleep latency, decreased total sleep time, and increased number and duration of awakenings after sleep onset and restless or fitful sleep. Nightmares often produce an insomnia-like pattern of sleep disturbance, if not outright insomnia. Sleep avoidance and fear of darkness, frequent features associated with PTSD-related nightmares, can further reinforce the maintenance of both nightmares and insomnia.

Recommended (by the Expert Consensus Guideline Series on the treatment of PTSD) first-line treatments include Food and Drug Administration (FDA)-approved SSRIs such as sertraline and paroxetine, and cognitive-behavioral interventions such as prolonged exposure and cognitive therapy. However, nightmares are often resistant to such first-line PTSD treatments, and adjunctive treatments are often required to alleviate PTSD-related nightmares.

Several psychological and pharmacological nightmare-focused treatments have been shown to effectively reduce and eliminate nightmares in PTSD patients. Successfully treated nightmare patients often report improvements in sleep quality, feeling more rested upon awakening and having more daytime energy, and reduction in nightmares is a significant predictor of sleep improvement. In addition, nightmare reduction is associated with marked improvements in daytime PTSD symptoms, quality of life, depression and anxiety symptoms, and overall functioning. These findings suggest that at least in some cases, chronic nightmares may represent a primary sleep disorder rather than a symptom of a psychiatric disorder, and as such can benefit from targeted, adjunctive cognitive-behavioral or pharmacological treatments.

Imagery Rescripting and Rehearsal

Numerous techniques have been proposed to treat PTSD-related nightmares, including hypnosis, lucid dreaming, eye movement desensitization and reprocessing, desensitization, and imagery rescripting and rehearsal (IRR). However, only desensitization and IRR have been the objects of controlled studies. Only IRR has been shown to effectively reduce nightmare frequency and nightmare-related distress in patients suffering from idiopathic, recurrent, or PTSD-related nightmares.

IRR for nightmares is composed of two general elements, each of which utilizes several steps in the therapeutic process. The first component is an educational/cognitive restructuring element, focused on helping nightmare sufferers to consider their disturbing dreams as a learned behavior. The second component is an imagery education/training element, which teaches nightmare patients about the nature of human imagery and how to implement a specific set of imagery steps to decrease nightmares. Generally, patients are shown how a nightmare can be effectively treated as a problem in and of itself, without any discussion or emphasis on prior traumatic events or nonsleep-related PTSD symptoms. As such, IRR seeks to minimize the use of exposure therapy as an ingredient in its procedures.

When learning IRR, patients are instructed to modify an original nightmare in any manner of their preference, and to create a new dream scenario. The new dream scenario is then rehearsed in session, and practiced each day until the next session. The rationale is that the rescripting and rehearsal of new dream imagery during the day can replace or alter nightmare scenarios experienced during sleep. Generally, patients report reductions in nightmare frequency and intensity within 6–12 weeks, and improvements are maintained for as long as 30 months.

Several variations of IRR have now been described. The distinguishing features between variations of IRR generally revolve around the degree of exposure used during treatment sessions and/or the specific application of the technique during the sessions. IRR can be delivered in group or individual formats. The number of sessions required for IRR can vary from one to six sessions. Since IRR involves minimal exposure and abreaction, its effectiveness is most likely related to the patient's ability to increase mastery over distressing dream elements by generating new dreams. Research on the scripting of new dreams linked to IRR indicates that mastery is in fact a key

ingredient in this treatment. The observed increase in mastery is all the more remarkable given that IRR does not include instructions to increase mastery when the technique is described during treatment. Although these data are consistent with the view that a dysfunctional imagery system is involved in traumatic nightmares, more work is required to elucidate the relationship between variables related to patient characteristics (e.g., traumatized vs. nontraumatized, presence of psychiatric and sleep disorders, dispositional factors, degree of distress), nightmare content and type (e.g., replicative, recurrent, lifelong, idiopathic), and therapeutic effects (e.g., enhanced self-efficacy, perceived control, modes of emotion expression and representation).

Prazosin

Prazosin is a central α1 adrenoreceptor blocker that is FDA-approved for the treatment of hypertension. Prazosin is currently the most efficacious treatment for PTSD-related nightmares in military veterans and civilian populations with PTSD. Promising results for the use of prazosin to reduce PTSD-related nightmares became available after the Expert Consensus Guideline Series on the treatment of PTSD were established. Results from controlled trials indicate that prazosin effectively reduces chronic PTSD-related nightmares in military and civilian sample groups with PTSD. Reduction in nightmares with prazosin is associated with clinically meaningful improvements in sleep quality, overall PTSD severity, and daytime functioning in combat veterans with chronic PTSD. Most patients experience a recurrence of insomnia and nightmares upon prazosin discontinuation. The drug is well tolerated by patients, is associated with minimal side effects, and no adverse events have been reported with long-term use.

Serotonin-Potentiating Drugs

Randomized controlled trials on the efficacy of FDA-approved SSRIs for the treatment of PTSD (i.e., sertraline and paroxetine) either did not measure improvements in sleep using validated measures, or reported minimal improvements in nightmares or overall sleep quality. In fact, some SSRIs may increase the number of arousals during sleep and decrease total sleep time. Open-label trials with fluvoxamine suggest moderate improvements in PTSD-related nightmares, but randomized controlled trials have not been conducted and side effects may impede tolerability. Open-label trials and case reports suggest that serotonin-potentiating non-SSRIs, such as nefazodone and trazodone, can be associated with reductions in PTSD-related nightmares and sleep disruption. However, double-blind randomized controlled trials in PTSD samples are not available. The need for rigorous randomized controlled trials is highlighted by the example of cyproheptadine. Initial case series suggested that cyproheptadine was a potent agent for the alleviation of PTSD-related nightmares. However, a subsequent double-blind, randomized controlled trial in Vietnam veterans with PTSD found that cyproheptadine could in fact exacerbate nightmares and sleep disruption. A few randomized controlled trials have evaluated the efficacy of monoamine oxidase inhibitors and tricyclic antidepressants for PTSD, and slight to moderate improvements were reported in some, but not all, studies. Optimal doses, durability of therapeutic gains, side effect profiles, and tolerability have not been assessed specifically for PTSD-related nightmares and sleep disruption with non-SSRIs, monoamine oxidase inhibitors, or tricyclic antidepressants. It should be noted that very few trials targeting clinically meaningful reductions in PTSD-related nightmares and sleep disturbances have used specific nightmare measures (e.g., questionnaires, sleep or dream logs) as primary outcome measures. Such measures are necessary to determine the effects of targeted treatments on specific aspects of nightmares, such as frequency, intensity, nightmare-induced sleep disruption, and associated distress.

Other Pharmacological Agents

Several medications that have sedative properties have been used in PTSD patients. Antipsychotics such as olanzapine and quetiapine have been tested in PTSD and have been associated with mixed findings as to their potential for reducing PTSD-related nightmares and insomnia. Despite the lack of evidence for their efficacy in reducing both daytime and nighttime PTSD symptoms, benzodiazepines are often prescribed to patients with PTSD. An open trial with zolpidem, a nonbenzodiazepine hypnotic, reported improvements in sleep and some improvements in nightmares in military veterans with PTSD. Case series reports on other pharmacological agents, such as topiramate, respiridone, and gabapentin, among others, are also available. While most cases report some degree of improvement in nightmares and insomnia in PTSD patients, proper randomized controlled trials are necessary to fully assess the efficacy of these agents as adjunctive PTSD treatments for nightmares and insomnia, and to determine associated health risks in light of side effects such as tolerance, weight gain, and glucose dysregulation.

See also: Amygdala: Contributions to Fear; Dream Function; Dreams and Dreaming: Incorporation of Waking Events; Dreams, Dreaming Theories and Correlates of Nightmares; Nightmares; Posttraumatic Stress Disorder: Overview; Posttraumatic Stress Disorder as an

Emotional Disorder; Sleep Mentation in REM and NREM: A Neurocognitive Perspective; Sleep and Sleep States: Phylogeny and Ontogeny; Sleep and Sleep States: PET Activation Patterns; The AIM Model of Dreaming, Sleeping, and Waking Consciousness.

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Relevant Websites

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http://www.istss.org – International Society for Traumatic Stress Studies.

http://www.ncptsd.org – National Center for PTSD (US Department of Veterans Affairs).